JC03 05 DEC 2000

S&H Form: FORM PTO-139

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE **TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371**	ATTORNEY'S DOCKET NUMBE 1633.1002 09/980640

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/KR99/00309	19 June 1999	16 June 1999

TITLE OF INVENTION
TIMEPIECE FROM WHICH SUNRISE AND SUNSET TIME CAN BE DETERMINED

APPLICANT(S) FOR DO/EO/US
Yoon-hyoung EO

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☒ This is an express request to immediately begin national examination procedures (35 U.S.C. 371(f)).
3. ☐ The US has been elected by the expiration of 19 months from the priority date (PCT Article
4. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
5. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
6. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (R
7. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
8. ☐ An oath or declaration of the inventor (35 U.S.C. 371(c)(4)).
9. ☐ A translation of the Annexes to the International Preliminary Examination Report under PC Article 36 (35 U.S.C. 371(c)(5)).

Items 10-15 below concern document(s) or information included:

10. ☐ An Information Disclosure Statement Under 37 CFR 1.97 and 1.98.
11. ☐ An assignment document for recording.
    Please mail the recorded assignment document to:
    a. ☐ the person whose signature, name & address appears at the bottom of this document.
    b. ☐ the following:
12. ☒ A preliminary amendment.
13. ☐ A substitute specification
14. ☐ A change of power of attorney and/or address letter.
15. ☒ Other items or information:

INTERNATIONAL SEARCH REPORT AND INTERNATIONAL PRELIMINARY EXAMINATION

09/980641
JC13 Rec'd PCT/PTO 05 DEC

☒ The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees as follows:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS	6 -20=	0	x $ 18.00	0.00
	INDEPENDENT CLAIMS	2 -3=	0	x $ 84.00	0.00
	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+$280.00	0.00
	BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4)): ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....$1,040 ☐ International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....$ 890 ☐ International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but international search fee (37 C.F.R. 1.445(a)(2) paid to USPTO...$ 740 ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provision of PCT Article 33(1)-(4).....$ 710 ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2) to (4) .....$ 100				1,040.00
	Surcharge of $130 for furnishing the National fee or oath or declaration later than ☐ 20 ☐ 30 mos. from the earliest claimed priority date (37 CFR 1.482(e)).				0.0
			TOTAL OF ABOVE CALCULATIONS		1,040.00
	Reduction by 1/2 for filing by small entity, if applicable. Affidavit must be filed also. (Note 37 CFR 1.9, 1.27, 1.28.)				
			SUBTOTAL		1,040.00
	Processing fee of $130 for furnishing the English Translation later than [ ] 20 [ ] 30 mos. from the earliest claimed priority date (37 CFR 1.482(f)).				
			TOTAL NATIONAL FEE		1,040.00
	Fee for recording the enclosed assignment (37 CFR 1.21(h)).				+
			TOTAL FEES ENCLOSED		1,040.00

a. ☒ A check in the amount of $1,040.00 to cover the above fees is enclosed.
b. ☐ Please charge my Deposit Account No. 19-3935 in the Amount of $ to cover the above fees. A duplicate copy of this sheet is enclosed.
c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required or credit any overpayment to Deposit Account No. 19-3935. A duplicate copy of this sheet is enclosed.

21171
PATENT TRADEMARK OFFICE

SUBMITTED BY: STAAS & HALSEY LLP

Type Name	James D. Halsey, Jr.	Reg. No.	22,729
Signature		Date	December 4, 2C

Docket No.: 1633.1002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Yoon-hyoung EO

Serial No. Unassigned

Group Art Unit: Unassigned

Confirmation No.

Filed: December 4, 2001

Examiner:

For: TIMEPIECE FROM WHICH SUNRISE AND SUNSET TIME CAN BE DETERMINED

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Before examination of the above-identified application, please amend the application as follows:

IN THE CLAIMS:

Please AMEND the pending claims and ADD new claims in accordance with the following:

3. (ONCE AMENDED) A timepiece according to Claims 1, wherein said hour hand includes a design symbolizing the sun.

6. (ONCE AMENDED) A timepiece according to Claim 4, wherein said hour hand includes a design symbolizing the sun.

REMARKS

This Preliminary Amendment is submitted to improve the form of the specification as originally-filed.

It is respectfully requested that this Preliminary Amendment be entered in the above-referenced application.

If there are any additional fees associated with filing of this Preliminary Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 12/4/02

By: _____
James D. Halsey, Jr.
Registration No. 22,729

700 Eleventh Street, NW, Suite 500
Washington, D.C. 20001
(202) 434-1500

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please AMEND claims 3 and 6 according to the following:

3. (ONCE AMENDED) A timepiece according to Claims 1 [or Claim 2], wherein said hour hand includes a design symbolizing the sun.

6. (ONCE AMENDED) A timepiece according to Claim 4 [or Claim 5], wherein said hour hand includes a design symbolizing the sun.

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TIMEPIECE FROM WHICH SUNRISE AND SUNSET TIME CAN BE DETERMINED

Background of the Invention

1. Field of the Invention

The present invention relates to a timepiece from which a sunrise and sunset time can be determined, and more particularly to a timepiece from which a sunrise and sunset time and the position of the sun at a specific place at the present time for a specific month can be determined by providing an hour hand which rotates once per 24 hours and a fixed plate or a rotating plate for designating a sunrise and sunset time with the timepiece.

2. Description of the Prior Art

Various kinds of time units are used according to a period and a region. For example, the presently used 24-division per day system was employed only before 100 years in the Orient. Before that, 12-division per day system, that is, 12-cycle (12-gabja in Korean) system had been used. When necessary, 100-division per system could be used. Recently, an internet time which is 1000-division per day system, has been suggested as the internet, the worldwide communication system is actively implemented in the world. However, the 24-division per day system, that is, 24-hour system is definitely fixed for the present time system. The timepiece for indicating the time includes a 12-divisional plate and an hour hand which rotates twice per day.

Nowadays, the widely used system of the date is the solar calendar which directly reflects the moving state of the sun around the earth. That is, one day is obtained from the time of one due culmination to the next due culmination at a

specific place. One day is divided into 24 hours and one hour is divided into 60 minutes. One year is obtained by measuring the time from the starting point to the next returning point to the starting point at a specific place on the ecliptic. The widely used calendar is the solar calendar and the timepiece is the system of the solar time system. A season and day and night can be determined through the relation of the sun and the earth. Therefore, a lot of the living period coincides with the system of the solar time system. However, most of the timepiece is 12-hour system of which hour hand rotates once per 24 hours for indicating the present time and so, the natural phenomenon such as the present position of the sun, the altitude and day and night can not be designated by the solar time system. This may break the natural band between nature and a human being.

When assuming that the culmination time of the sun in Republic of Korea is 12 o'clock (since the standard meridian line in Republic of Korea, is the east longitude of 135 , the real culmination time is 12 o'clock 30 minutes), the sun rises from the due east and sets to the due west on vernal equinox day and autumnal equinox day. The sunrise time on these days is 6 o'clock a.m. while the sunset time is 6 o'clock p.m. On summer shoot, the sun rises from the northeast and sets to the northwest and the sunrise time is about 4 o'clock 40 minutes a.m. and the sunset time is about 7 o'clock 20 minutes p.m. Therefore, the day time on the summer shoot is longer by about 2 hours and 40 minutes than that on the vernal equinox day or autumnal equinox day. On the winter solstice, the sun rises from the southeast and sets to the southwest and the sunrise time is about 7 o'clock 20 minutes a.m. and the sunset time is about 4 o'clock 40 minutes p.m. Therefore, the day time on the winter solstice is shorter by about 5 hours and 20 minutes than that on the vernal equinox day or autumnal equinox day, while the

night time on winter solstice is longer by the same length.

The sunrise time and the sunset time are different from day to day and the difference is accumulated to become about 30 minutes every month.

The sunrise time and the sunset time are changed according to a season and the latitude of the place where the man measures the times.

Even though the sunrise time and the sunset time are very important information in daily life, this information could not be easily obtained without taking a look on the news from a television or a newspaper.

In addition, the enlargement of the urbanization brings about the increased underground activities and the activities in closed buildings, and so most of the people could not see the sun in the actual circumstance.

Summary of the Invention

Accordingly, it is an object of the present invention to solve the above-mentioned problems and to provide a timepiece for determining the sunrise time and the sunset time and the position of the sun at the present time for a specific place and for a specific month, through including an hour hand which rotates once per 24 hours, and a fixed plate or a rotating plate for designating the sunrise and sunset time.

The object of the present invention can be accomplished by a timepiece comprising an hour hand which rotates once per 24 hours, and a bottom plate which is provided with a sunrise and sunset time designating section for designating a scale corresponding to a sunrise and sunset time for each month.

The timepiece of the present invention can further comprise a minute hand which rotates once per hour.

The shape of the hour hand can be the common shape and the hour hand can include a design symbolizing the sun.

Brief Description of the Drawings

The above object and advantages of the present invention will become more apparent by describing in detail preferred embodiments thereof with reference to the attached drawings in which:

FIG. 1 is a planar view of an embodiment according to the present invention;

FIG. 2 is a planar view of a bottom plate according to an embodiment of the present invention;

FIG. 3 is a planar view of another embodiment according to the present invention;

FIG. 4 is a planar view of a sunrise time designating plate according to another embodiment of the present invention; and

FIG. 5 is a planar view of a sunset time designating plate according to another embodiment of the present invention.

Detailed Description of the Invention

Hereinafter, preferred embodiments of the present invention will be explained in more detail with reference to the accompanying drawings.

Referring to FIGs. 1 & 2, an hour scale 4 can be represented by designating the numerals from 1 to 24, by designating the numerals from 1 to 12 for representing ante meridian hours and continuously the numerals from 1 to 12 for representing post meridian hours or by designating the numerals of 3, 6, 9

and 12 with '0' or specific mark for the remaining intermediate numerals.

The numerals corresponding to the ante meridian hours and the numerals corresponding to the post meridian hours can be designated in different brightness or color saturation for an easy notice. Or the brightest numeral may be positioned at the noon and the numerals from the noon to midnight may be gradually darkened and the numerals from the midnight to the noon may be gradually brightened again.

Preferably, hour scale 4 can optionally rotate in order to adjust the time when daylight saving time is applied.

The rotation of hour hand 1 can be a continuous analog-type rotation or a digital-type rotation in which hour hand 1 rotates by one scale per hour.

The rotational axis of minute hand 3 can be the same with that of hour hand 1 and can be placed at a predetermined position on the bottom plate.

On a minute scale 5 of the present invention, minutes can be indicated by the numerals of 0, 10, 20, ...50 or by the numerals of 0, 15, 30 and 45, as occasion needs.

The rotational directions of hour hand 1 and minute hand 2 can be optionally determined. When each hand rotates counterclockwise, the order of the designating numerals of hour hand 1 and minute hand 3 should be clockwise.

Bottom plate 1 having a sunrise and sunset time designating section 21, is fixed. The angle between sunrise and sunset designating section 21 and a horizontal line (the line connecting common 3 o'clock direction with 9 o'clock direction) is different depending on its latitude. That is, the designating section 21 will approach the horizontal line at low latitude, while become more distant from the horizontal line at high latitude. The same sunrise and sunset designating

section 21 can be used within Republic of Korea. However, a different timepiece having a different sunrise and sunset designating section 21 is needed for foreign countries such as USA, Russia, China, Japan and the like of which territory is wide or the shape of the territory is long from south to north.

When the standard meridian line in Korea is 127.5 (actually, east longitude of 135), and when numeral 12 of hour scale 4 coincides with hour hand 1, it means that the sun is culminated and the rotation of hour hand 1 is the same with the rotation of the sun. Accordingly, a red dot can be drawn as the symbol of the sun or a taegeug design or a star can be drawn for indicating the position of the sun at a specific time.

Utilizing the timepiece having the above-mentioned constitution, the present time and the position of the sun can be recognized by the common method. That is, when hour hand 1 is positioned on the common 12 o'clock direction, the sun is culminated, when positioned above the connecting line of sunrise and sunset time designating section 21 (in case of May, the connecting line of May in the left portion of the sunrise and sunset time designating section and the center point of the timepiece and the connecting line of May in the right portion of the sunrise and sunset time designating section and the center point of the timepiece), the sun is in the state of floating in the sky and when positioned below the connecting line, the sun is below the horizontal line. When hour hand 1 is on the connecting line of the month, the sun is in sunrise or sunset state.

The object of the present invention also can be accomplished by a timepiece from which the sunrise time and the sunset time and the position of the sun can be determined, the timepiece comprising an hour hand 1 which rotates once per 24 hours; a sunrise time designating plate 2a including a sunrise time

designating section 21a having scales for indicating the sunrise time; and a sunset time designating plate 2b including a sunset time designating section 21b having scales for indicating the sunset time. One of sunrise time designating plate 21a and sunset time designating plate 21b can rotate optionally. And the other plate rotates to the counter direction of the first plate while keeping the interlocking state with the first plate.

The timepiece of the present invention can further include minute hand 3 which rotates once per hour.

The shape of hour hand 1 can be the common shape and hour hand 1 can include a design symbolizing the sun.

Sunrise time designating plate 2a and sunset time designating plate 2b can be manufactured by drawing a line from each center point to the end portion of each plate or by designating marks at the end portion of each plate for indicating the sunrise time and the sunset time. More preferably, the characters of the sunrise or sunset, or the sunrise time or sunset time may be designated on a predetermined position of each plate as shown in FIGs. 4 & 5.

One of sunrise time designating plate 2a and sunset time designating plate 2b, is manufactured for optionally rotating by a manual operation while manufacturing the remaining plate rotating to the counter direction of the first plate and keeping the interlocking state with the first plate. At a predetermined position on the two plates, on the glass cover, on the case and the like, a guide for the manual operation can be indicated for the optional rotation by the manual operation. Since the time from the sunrise to the culmination and the time from the culmination to the sunset during a day, is the same, it is preferred that the two plates keep the interlocking state with each other for accomplishing a minuter

operation. Of course, the two plates can be operated by different manual operations without keeping the interlocking state.

Through utilizing the timepiece having the above-described constitution according to the present invention, the present time, the position of the sun at the present time, the sunrise time and the sunset time, can be appreciated. In particular, the external state such as the bright state of day or the dark state of night, can be easily achieved even in the underground city and in a closed space by using the timepiece of the present invention.

In order to realize the directions of sunrise and sunset on the timepiece, in the timepiece of the present invention, it is preferred to make indicators, for example, "E" and "W", at the hour scales of AM6 and PM 6, respectively.

Although the preferred embodiments of the invention have been described only for the structure and the rotational velocity of each plate, it is understood that the present invention should not be limited to the preferred embodiments, but various changes and modifications can be made by one skilled in the art within the spirit and scope of the invention as hereinafter claimed. That is, the timepiece of the present invention can be operated by a mechanical manner through the combination of a driving apparatus and sawtooth having a predetermined rotating ratio. Further the recognition of the data from the timepiece of the present invention can be implemented through an electronic manner using a display device such as an LCD(liquid crystal display device) or a CRT(cathod ray tube).

Effect of the Invention

Through utilizing the clock having the above-described constitution according to the present invention, the present time, the position of the sun at the

present time, the sunrise time and the sunset time, can be appreciated. In particular, the external state such as the bright state of day or the dark state of night, can be easily achieved even in the underground city and in a closed space by using the clock of the present invention.

What is claimed is:

1. A timepiece for indicating a sunrise and sunset time and a position of the sun comprising:

an hour hand which rotates once per 24 hours; and

a bottom plate including a sunrise and sunset time designating section for designating a scale corresponding to said sunrise time and said sunset time for each month.

2. A timepiece according to Claim 1, comprising a minute hand which rotates once per hour.

3. A timepiece according to Claim 1 or Claim 2, wherein said hour hand includes a design symbolizing the sun.

4. A timepiece for indicating a sunrise and sunset time and a position of the sun comprising:

an hour hand which rotates once per 24 hours;

a sunrise time designating plate including a sunrise time designating section having a scale for indicating said sunrise time; and

a sunset time designating plate including a sunset time designating section having a scale for indicating said sunset time,

one of said sunrise time designating plate and said sunset time designating plate in rotation, with the other plate in rotation to a counter direction to said first plate while keeping an interlocking state with said first plate.

5. A timepiece according to Claim 4, comprising a minute hand which rotates once per hour.

6. A timepiece according to Claim 4 or Claim 5, wherein said hour hand includes a design symbolizing the sun.

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(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW.

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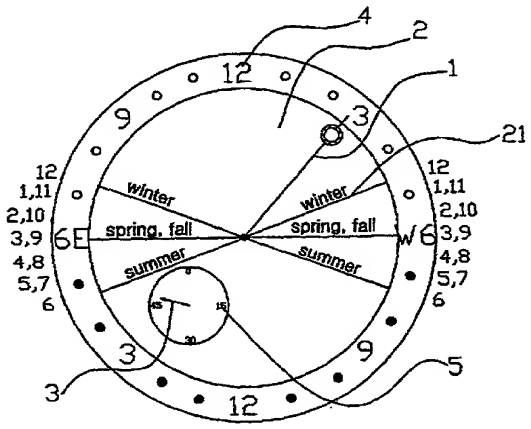
Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TIMEPIECE FROM WHICH SUNRISE AND SUNSET TIME CAN BE DETERMINED



(57) Abstract: Disclosed is a timepiece from which a sunrise and sunset time along with the position of the sun can be determined. The sunrise time and the sunset time are changed according to the season and the latitude of the place where one man measures the time. People acquire the sunrise and sunset time from the news of a television or a newspaper. According to the enlargement of cities, underground activities and the degree of building closure are increased to shield the sun. The timepiece of the present invention comprises a circular hour plate which rotates once per 24 hours. Also included is a sunrise and sunset time designating section (21) for indicating the sunrise time and the sunset time for each month. Through the timepiece of the present invention, the present time, the position of the sun at the present time, the sunrise and sunset time can be appreciated. In particular, the external state of the day or night can be easily distinguished by the people in the underground and in a closed building, through using the timepiece of the present invention.

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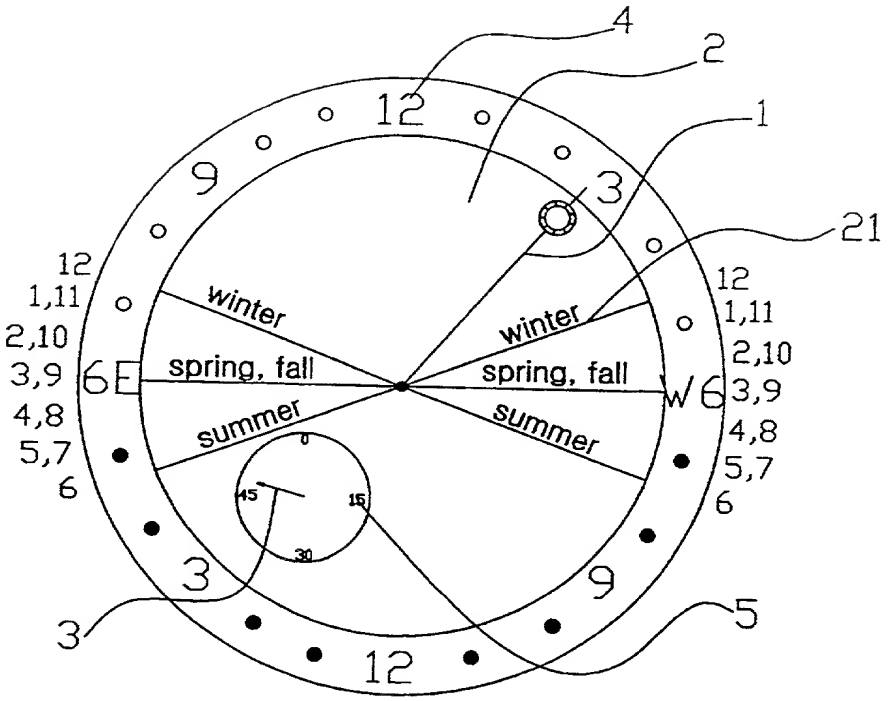

Fig. 1

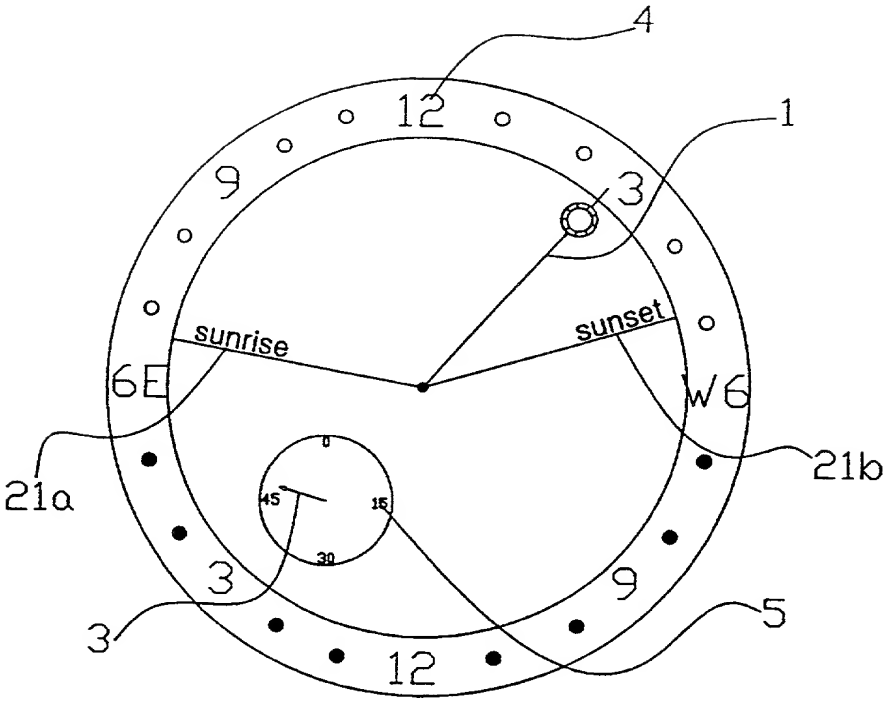

Fig. 2

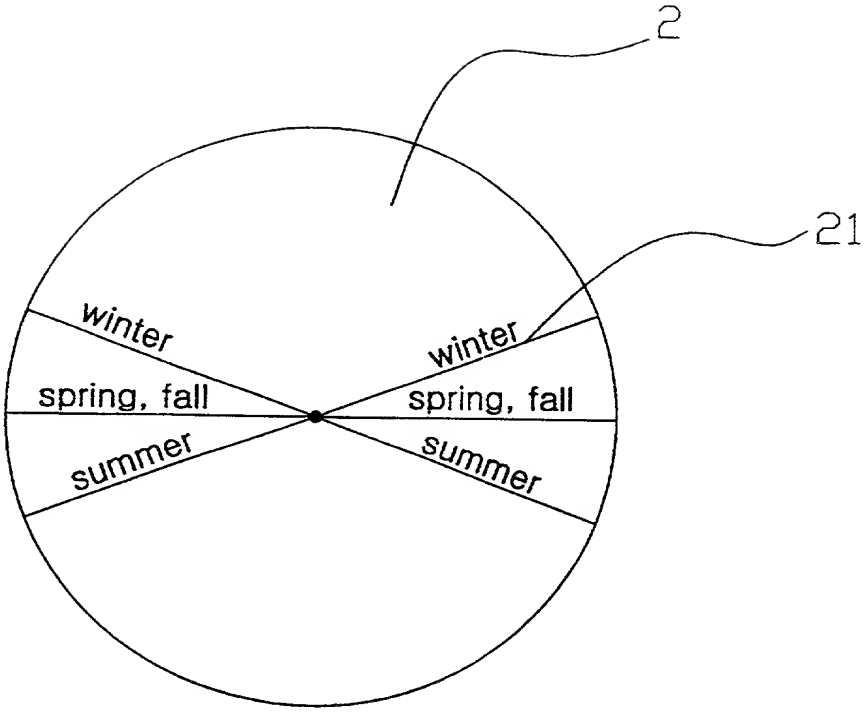

Fig. 3

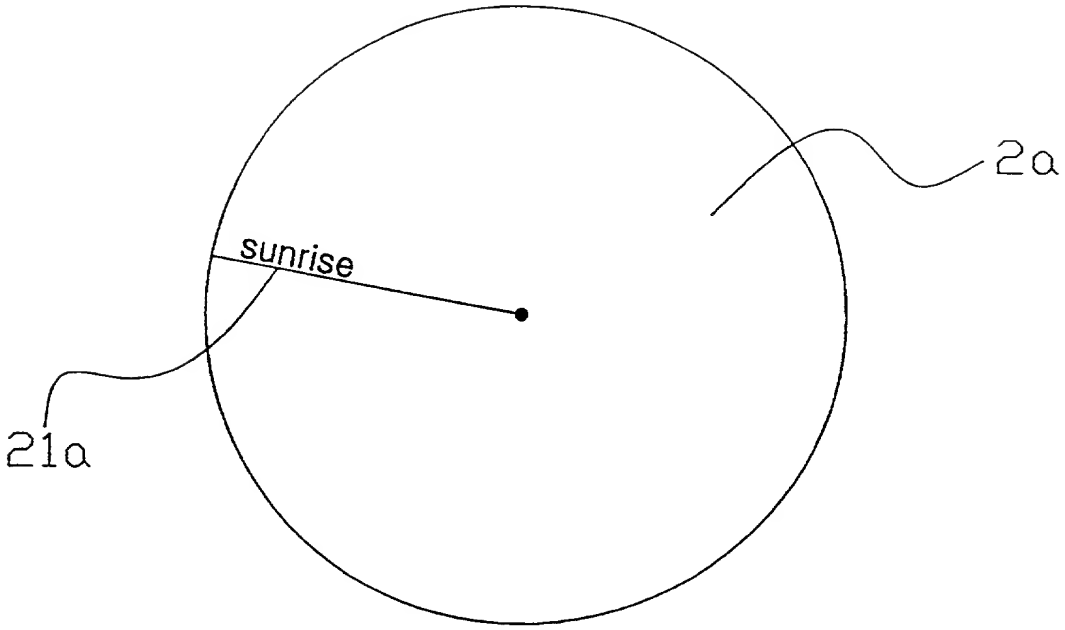

Fig. 4

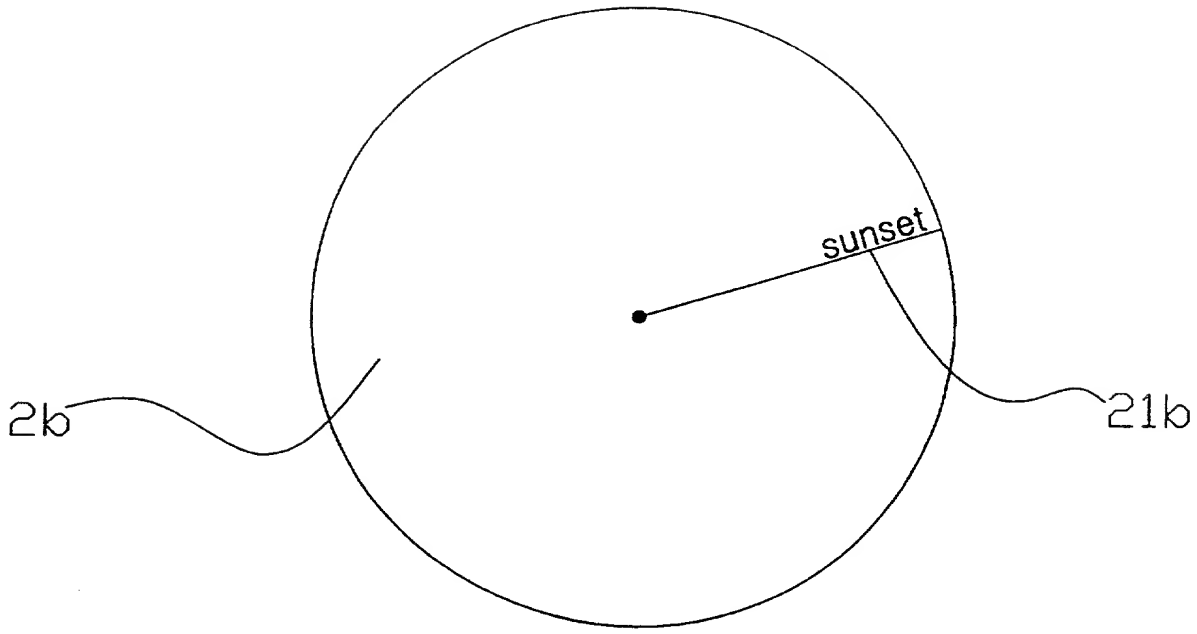

Fig. 5

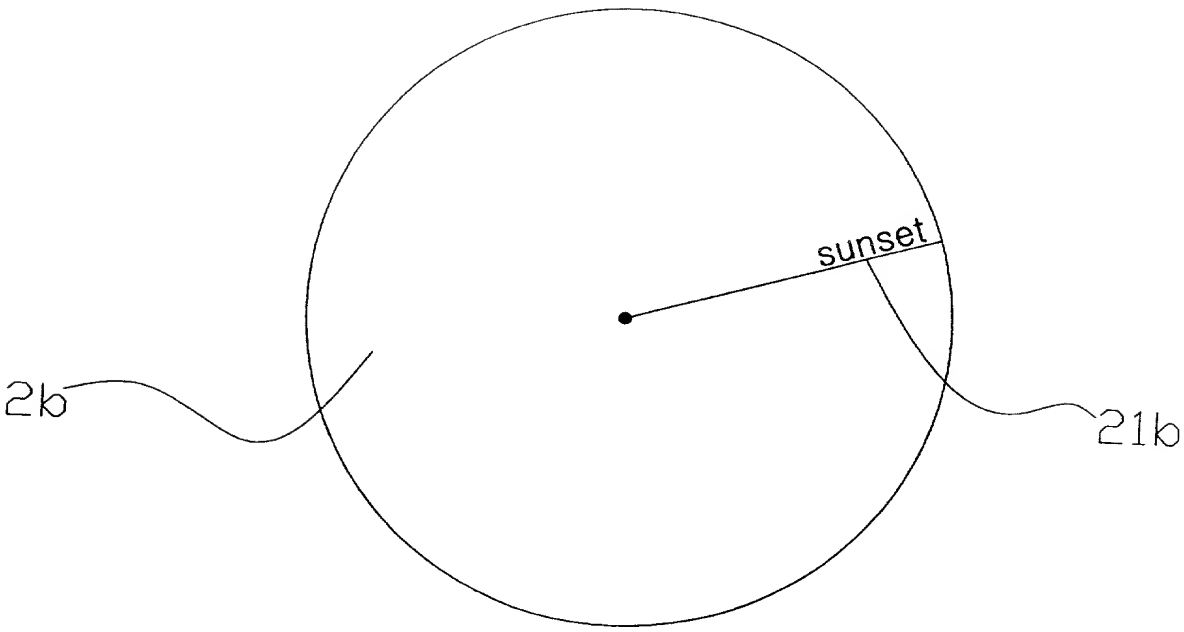

Fig. 5

Form (Rev. 2/01) UNITED STATES Docket No.: 1633.1002

COMBINED DECLARATION/POWER OF ATTORNEY FOR UTILITY/DESIGN PATENT APPLICATION

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name.
I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

TIMEPIECE FROM WHICH SUNRISE AND SUNSET TIME CAN BE DETERMINED

the specification of which is attached hereto, unless the following box is checked:
☐ was filed on __ as United States Application Number or PCT International Application Number ___ and was amended on (if applicable).
I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.
I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56.
I hereby claim foreign priority benefit(s) under 35 U.S.C. § 119(a)-(d) or § 365(a)-(c) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)			Priority NOT Claimed
1999-22609 (Number)	Korea (Country)	16/June/1999 Day/Month/Year Filed	☐
(Number)	(Country)	Day/Month/Year Filed	☐

I hereby claim the benefit under 35 U.S.C. § 120 or § 119(e) of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application Serial No.)	(Filing Date)	(Status – patented, pending, abandoned)
PCT/KR99/00309	June 17, 1999	Pending
(Application Serial No.)	(Filing Date)	(Status – patented, pending, abandoned)

I hereby appoint the attorneys and agents of Staas & Halsey LLP under USPTO Customer No. 21,171 to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

21171
PATENT TRADEMARK OFFICE

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor Yoon-hyoung EO

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